
Rare and Invasive Botanical Surveys for Rayonierat Upper Fahnestock Creek near Sappho, WA



Prepared by:

Erin Colclazier, Lead Botanist
Hamer Environmental, L.P.
1510 S 3rd Street, Mt. Vernon, WA 98273
(360) 899-5156

Prepared for:

Rayonier, Inc.
3033 Ingram Street
Hoquiam, WA98550

8 August 2012

TABLE OF CONTENTS

INTRODUCTION.....	3
BACKGROUND.....	6
SURVEY AND MANAGE SPECIES	6
SENSITIVE SPECIES	6
PREVIOUS RARE PLANT SIGHTINGS	6
NOXIOUS WEEDS.....	7
METHODS.....	7
CONDUCTING SURVEYS.....	7
SURVEY EFFORT.....	8
DATA COLLECTION	8
RESULTS.....	8
DISCUSSION	9
PLANT SPECIES ENCOUNTERED	9
LITERATURE CITED.....	9
APPENDIX 1.....	11
APPENDIX 2.....	12
APPENDIX 3.....	14
APPENDIX 4.....	16

INTRODUCTION

Rayonier, Inc. (Rayonier) has proposed to reopen an old spur road off of US Forest Service (USFS) C8500 road. This road runs through lands managed by the USFS within the boundaries of Olympic National Forest. The spur road is located off of Mary Clark and C8000 Roads, approximately 6 miles south of Sappho in Clallam County, Washington. According to USFS regulations, rare plant and noxious weed surveys must be conducted prior to any ground disturbing activities. To fulfill these regulations, vascular and non-vascular rare plant and noxious weed surveys were conducted by Erin Colclazier, Lead Botanist of Hamer Environmental L.P. for Rayonier Western Forest Resources.

The two sites selected for survey are located on Olympic National Forest lands approximately 5.5 miles south from the intersection with Highway 101. The Upper Fahnestock Creek Road is located at T29N, R12W, Sec. 26 with survey sites located at NW¹/₁₆ of SW ¹/₄ (Site A) and SE ¹/₁₆ of NW ¹/₄ (Site B) of Sec. 26 respectively (Figures 1, 2).

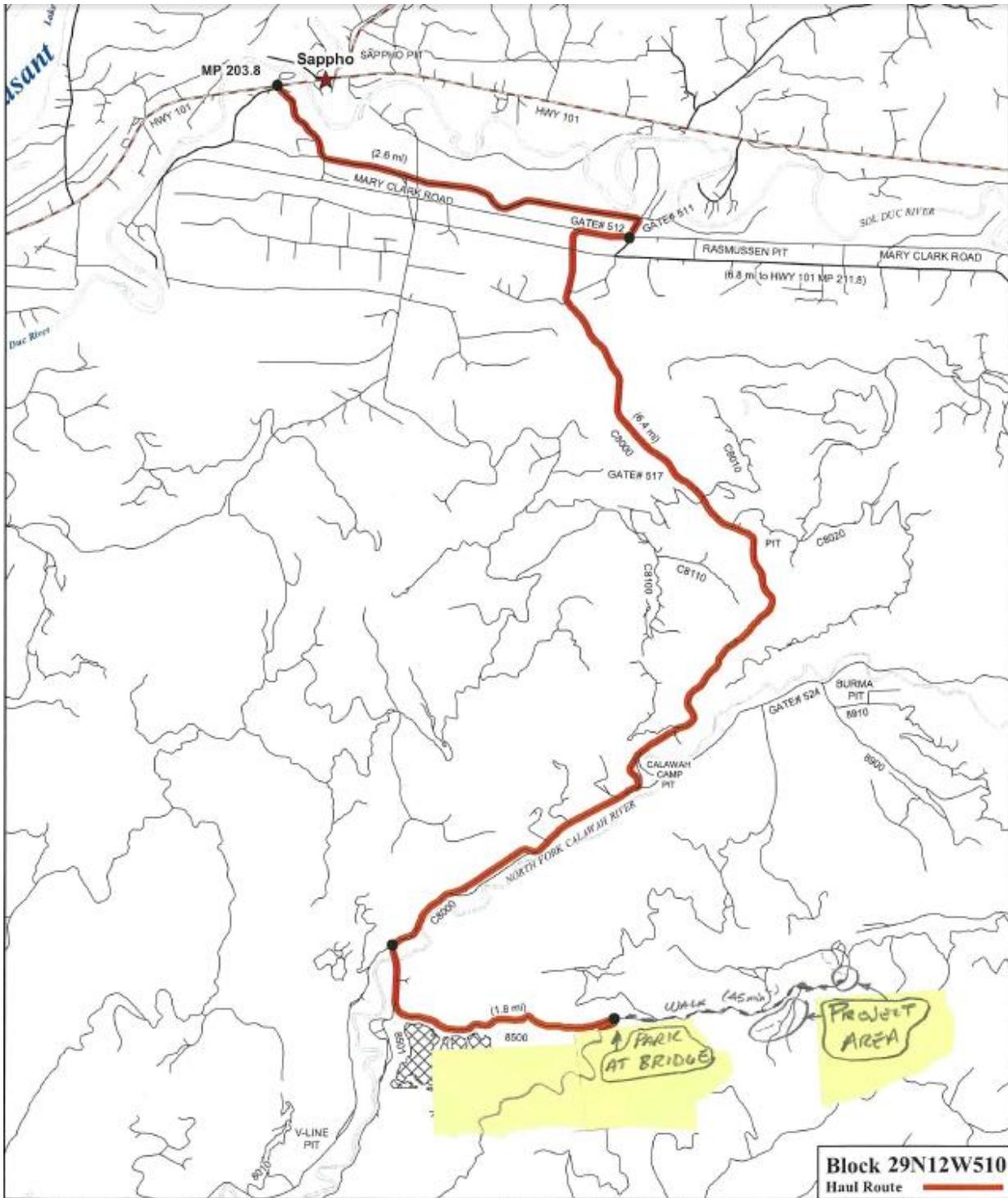


Figure 1. Upper Fahnestock Road Site Vicinity location (project access identified with red and survey sites A (west) and B (east) identified as project areas), Clallam County, WA, 2012.

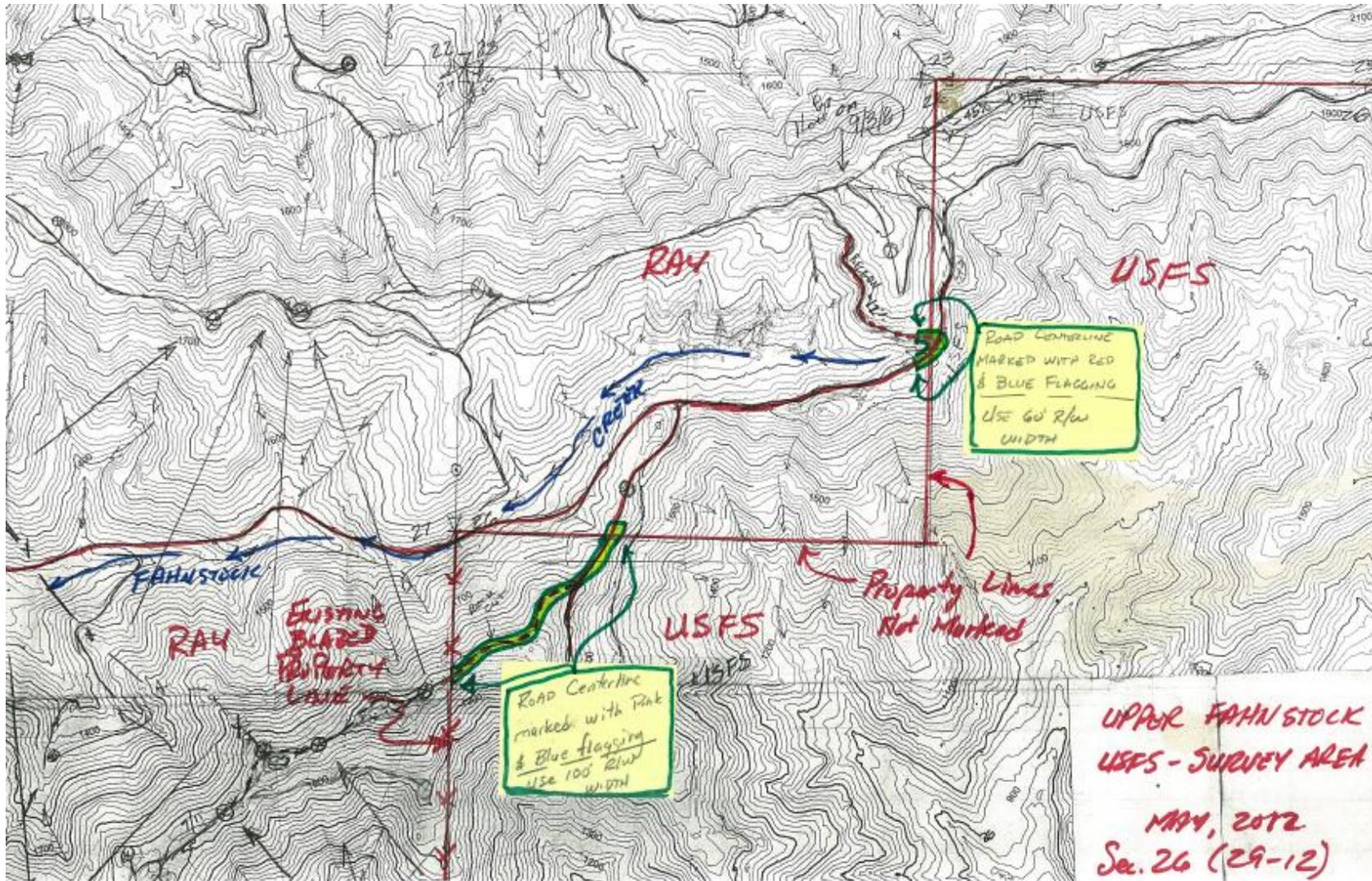


Figure 2. Upper Fahnestock Creek USFS Road Project map, with highlighted USFS survey area segments (yellow and green) and land ownership noted in red. Project is reopening of Upper Fahnestock Creek Road, Clallam County, Washington, 2012.

BACKGROUND

To define the species to search for, a combined rare plant list consisting of the Olympic National Forest Sensitive Plant Species and Strategic Plant Species lists (a subset of the USFS Region 6 Sensitive Species List), and the USFS Survey and Manage (S&M) Plant list were utilized. The term “rare plant” in this report refers collectively to the species on these lists.

Survey and Manage Species

Species designated as Survey and Manage Species (S&M) are considered to be “at risk” under the Northwest Forest Plan. The list of designated species is reviewed annually by the USFS and Bureau of Land Management (BLM). According to the Northwest Forest Plan, surveys for S&M Category A& C species must be conducted prior to any habitat disturbing activity. The S&M list updated in April 2004 was used in this survey (Appendix 1).

Sensitive Species

In accordance with the National Forest Management Act, sensitive plant populations must be managed so that listing under the Endangered Species Act is avoided. The USFS Region 6 Sensitive Species list identifies the sensitive plant species occurring or suspected to occur in Washington and Oregon. The Olympic National Forest Sensitive Plant list is a subset of the Region 6 Species list. This secondary list identifies species known or suspected to occur on the Olympic National Forest. Our botanist familiarized herself with both Region 6 and Olympic National Forest Sensitive and Strategic Plant lists (Appendix 2). There were no known federally listed plant species in the survey area.

Previous Rare Plant Sightings

The Olympic National Forest botanist listed the following rare lichen, bryophyte and vascular plant species as those most likely to occur within the general vicinity of the project:

Usnealongissima(lichen),

Platismatialacunosa(lichen), *Cetreliaetrarioides*(lichen), *Nephroma*

bellum(lichen), *Iwatsukiellaleucotricha*(moss), *Tetraphisgenuiculata*(moss),

Cimicifugaelata var. *elata* (vasc. plant), and *Erythronium quinaultense* (vasc. plant, syn. *E. revolutum*), (Cheryl Bartlett, pers. comm.). *Usnealongissimas* typically found in the canopy or sub-canopy layer of trees, though is infrequently found growing on shrubs. *U. longissima* can be identified using binoculars to scan tree canopies or as blow-down on the forest floor. *Cetreliaetrarioides* grows on alders or other hardwoods, typically on older, well-established alder stands. *Iwatsukiellaleucotricha* moss is found on trunks and branches of conifers and alders (Harpel 2006). *Cimicifugaelata* generally grows in or along the margins of mixed, mature or old growth stands of coniferous or mixed coniferous-deciduous forest. *Erythronium quinaultense* occurs in openings and rock ledges in coniferous forests at an elevation of 1640 to 2953 feet (WNHP 2005).

Noxious Weeds

Noxious weeds were also of interest to Olympic National Forest personnel, and were included for survey in this project (Appendix 3). Additionally, the 2011 Clallam County Noxious Weed list to determine our target species for noxious weed surveys (<http://www.clallam.net/WeedControl/assets/applets/2011WEBWeedList.pdf>).

METHODS

Hamer Environmental obtained project site maps from Meghan Tuttle, Road Maintenance and Project Supervisor for Rayonier, which delineated the segments of land to be surveyed (Figures 1 and 2). Clear boundaries were delineated at the project site by Rayonier. The centerline and entire length of each road segment were flagged for the proposed spur road. Botanical surveys encompassed the proposed road spur segment and an additional 150-foot buffer, covering 75 feet on either side of the proposed road spur centerlines.

Conducting Surveys

Due to the relatively small size of the survey site, a complete 100% survey method was utilized to locate rare plants and noxious weeds within the project area. Typically, rare plant surveys are conducted utilizing an intuitive control search method to focus on the

microhabitats most likely to contain target rare plant species. For this botanical survey, additional time was spent in areas with higher likelihood of rare plant presence; but all areas were thoroughly surveyed. Protocols established by the US Forest Service were followed to thoroughly search each site (Hibler and O'Dell 1998, USDA/USDI 1998, Whiteaker et al. 1998, USDA/USDI 1999). The survey was conducted 27-28 June 2012 by Hamer Environmental lead botanist, Erin Colclazier.

Survey Effort

The Hamer botanist implemented a complete version of the standard intuitive controlled survey, which typically cover an estimated 60 to 80% of the survey area, (Whiteaker et al., 1998). This survey method was selected for consistency with USFS methodologies and to ensure thorough coverage of survey areas. Intuitive controlled, complete surveys have a finer accuracy level than field check, general, cursory or limited focus surveys. Because of the diverse habitat requirements for rare plant species, large areas contained potential habitat for one species or another. Therefore, closely spaced meander routes were chosen to search the entire area and generate the most complete species inventory possible, while the small size of project areas allowed botanical surveyor to conduct complete surveys in a time efficient manner.

Data Collection

A comprehensive list of vascular plants, lichens, and bryophytes was compiled. All plants were identified to the species level, unless of a genus that was difficult to identify to species and did not contain a rare species. A survey documentation form was completed for the Rayonier Upper Fahnestock Creek Road Project.

RESULTS

A botanical survey was conducted at the proposed road expansion sites of Upper Fahnestock Creek on Olympic National Forest lands. A total of 60 vascular and 29 non-vascular plants were identified at the two survey sites combined (Appendix 4). Note that species lists were compiled separately for each of the two road segments (Appendix 4). No rare vascular or non-vascular plants were found within the project area.

Five noxious weed species: oxeye daisy (*Leucanthemum vulgare*), foxglove (*Digitalis purpurea*), St. Johnswort (*Hypericum perforatum*), narrow-leaf plantain (*Plantago lanceolata*) and creeping buttercup (*Ranunculus repens*) were identified within the project area. Although oxeye daisy, foxglove, St. Johnswort, narrow-leaf plantain and creeping buttercup are listed as noxious weeds by Olympic National Forest, they are designated as “Tolerated” and do not require formal documentation when identified.

DISCUSSION

Plant Species Encountered

A complete species inventory for the vascular and non-vascular plant species identified is listed in Appendix 4. A complete plant inventory was conducted at these sites, as rare plant and noxious weed lists are dynamic. Any subsequent changes to rare and noxious plant lists can be cross-referenced against these existing species inventories for preliminary investigations addressing the presence/absence of any species added to the lists in future years.

LITERATURE CITED

Franklin, J.F. and C.T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. USDA Forest Service General Technical Report PNW-8.

Harpel, J. 2006. *Iwatsukiella leucotricha* field guide. Unpublished report for Washington Department of Natural Resources Natural Heritage Program.

Hibler, C. and T. E. O’Dell. 1998. Survey Protocols for *Bridgeoporus* (= *Oxyporus*) *nobilissimus*, Version 2.0.

USDA Forest Service/USDI Bureau of Land Management. 1999. Survey Protocols for Protection Buffer Bryophytes, Version 2.0.

USDA, Forest Service/USDI Bureau of Land Management. 1998. Survey Protocols for Component 2 Lichens, Version 2.0.

USDA Forest Service/USDI Bureau of Land Management. 2003. Survey and Manage Plant Species Lists.

Washington Natural Heritage Program (WNHP). 2005. *Field Guide to Selected Rare Vascular Plants of Washington*. Washington Natural Heritage Program and U.S.D.I. Bureau of Land Management. Olympia, WA.

Washington State Noxious Weed Control Board. 2002. Written Findings of the State Weed Control Board. <http://www.ncwb.wa.gov>.

Whiteaker, et. al. 1998. Survey Protocols for Vascular Plants. Version 2.0.

Personal Communication

Bartlett, Cheryl. Botanist, Olympic National Forest. Personal communication on July 12, 2011 with Erin Colclazier, Lead Botanist for Hamer Environmental L.P. via email.

APPENDIX 1.

Survey and Manage Plant Species Requiring Pre-Disturbance Surveys(USDA/USDI, 2003).

Vascular Plants

Botrychium montanum Mountain grape-fern
Coptis aspleniifolia Spleenwort-leaved goldthread
Coptis trifolia Three-leaved goldthread
Corydalis aquae-gelidae Clackamas corydalis
Cypripedium fasciculatum Clustered lady's slipper
Cypripedium montanum Mountain lady's slipper
Eucephalus vialis (Aster vialis) Wayside aster
Galium kamtschaticum Boreal bedstraw
Platanthera orbiculata var. orbiculata Large round-leaved orchid

Lichens

Bryoria pseudocapillaris
Bryoria spiralifera
Dendriscoaulon intricatulum
Hypogymnia duplicata
Leptogium cyanescens
Lobaria linita
Nephroma occultum
Niebla cephalota
Pseudocyphellaria perpetua
Pseudocyphellaria rainierensis
Ramalina thrausta
Teloschistes flavicans
Usnea longissima

Bryophytes

Schistostega pennata
Tetraphis geniculata

Fungi

Bridgeporus (Oxyporus) nobilissimus Noble polypore

APPENDIX 2.Olympic National Forest Sensitive and Strategic Plant Species List**Sensitive Species Documented or Suspected to Occur on Olympic National Forest**

Taxon	Scientific Name	Common Name	ISSSSP Status
VASC	ASTRAGALUS AUSTRALIS VAR. OLYMPICUS	COTTON'S MILK-VETCH	WA-SEN
VASC	ASTRAGALUS MICROCYSTIS	LEAST BLADDERY MILK-VETCH	WA-SEN
VASC	BOTRYCHIUM ASCENDENS	UPWARD-LOBED MOONWORT	SEN
VASC	CAREX ANTHOXANTHEA	YELLOW-FLOWERED SEDGE	WA-SEN
VASC	CAREX CIRCINATA	COILED SEDGE	WA-SEN
VASC	CAREX OBTUSATA	BLUNT SEDGE	WA-SEN
VASC	CAREX PAUCIFLORA	FEW-FLOWERED SEDGE	WA-SEN
VASC	CAREX STYLOSA	LONG-STYLED SEDGE	WA-SEN
VASC	CHRYSOLEPIS CHRYSOPHYLLA	GOLDEN CHINQUAPIN	WA-SEN
VASC	CIMICIFUGA ELATA VAR. ELATA	TALL BUGBANE	SEN
VASC	COPTIS ASPLENIIFOLIA	SPLEENWORT-LEAVED GOLDTHREAD	WA-SEN
VASC	COPTIS TRIFOLIA	THREE-LEAF GOLDTHREAD	SEN
VASC	DODECATHEON AUSTRORFRIGIDUM	FRIGID SHOOTINGSTAR	SEN
VASC	DRABA CANA	LANCE-LEAVED DRABA	WA-SEN
VASC	DRABA LONGIPES	LONG-STALKED DRABA	WA-SEN
VASC	DRYAS DRUMMONDII	YELLOW MOUNTAIN-AVENS	WA-SEN
VASC	ERIGERON ALICEAE	ALICE'S FLEABANE	WA-SEN
VASC	ERYTHRONIUM QUINAULTENSE	QUINAULT FAWNLIY	WA-SEN
VASC	GALIUM KAMTSCHATICUM	BOREAL BEDSTRAW	WA-SEN
VASC	HEDYSARUM OCCIDENTALE	WESTERN HEDYSARUM	WA-SEN
VASC	MONTIA DIFFUSA	BRANCHING MONTIA	WA-SEN
VASC	OPHIOGLOSSUM PUSILLUM	ADDER'S-TONGUE	SEN
VASC	PARNASSIA PALUSTRIS VAR. NEOGAEA	NORTHERN GRASS-OF-PARNASSUS	WA-SEN
VASC	PELLAEA BREWERI	BREWER'S CLIFF-BRAKE	WA-SEN
VASC	POA LAXIFLORA	LOOSE-FLOWERED BLUEGRASS	WA-SEN
VASC	POLEMONIUM CARNEUM	GREAT POLEMONIUM	WA-SEN
VASC	RANUNCULUS COOLEYAE	COOLEY'S BUTTERCUP	WA-SEN
VASC	SPIRAEA SPLENDENS	SUBALPINE SPIREA	WA-SEN
VASC	SYNTHYRIS PINNATIFIDA VAR. LANUGINOSA	FEATHERLEAF KITTENSTAILS	WA-SEN
BR	BARTRAMIOPSIS LESCURI	MOSS	WA-SEN
BR	IWATSUKIELLA LEUCOTRICHA	MOSS	SEN
BR	SCHISTOSTEGA PENNATA (*)	MOSS	SEN
BR	TETRAPHIS GENICULATA (*)	MOSS	SEN

Sensitive Species Documented or Suspected to Occur on Olympic National Forest

Taxon	Scientific Name	Common Name	ISSSP Status
LI	CETRELIA CETRARIOIDES (*)	LICHEN	WA-SEN
LI	COLLEMA NIGRESCENS (*)	LICHEN	WA-SEN
LI	DERMATOCARPON MEIOPHYLLIZUM (*)	LICHEN	SEN
LI	LEPTOGIUM BURNETIAE (*)	LICHEN	SEN
LI	NEPHROMA BELLUM (*)	LICHEN	WA-SEN
LI	PLATISMATIA LACUNOSA (*)	LICHEN	WA-SEN
LI	PSEUDOCYPHELLARIA RAINIERENSIS (*)	LICHEN	SEN
LI	USNEA LONGISSIMA (*)	LICHEN	SEN

Strategic Species Documented or Suspected to Occur on Olympic National Forest

Taxon	Scientific Name	Common Name	ISSSP Status
VASC	ARABIS FURCATA VAR. OLYMPICA	OLYMPIC NUTTALL'S ROCKCRESS	WA-STR
VASC	CAREX PLURIFLORA	MANY-FLOWERED SEDGE	STR
VASC	ERIGERON PEREGRINUS VAR. THOMPSONII	THOMPSON'S WANDERING DAISY	WA-STR
VASC	OXYTROPIS BOREALIS VAR. VISCIDA (1)	STICKY CRAZYWEED	WA-STR
VASC	PLANTAGO MACROCARPA	NORTH PACIFIC PLANTAIN	STR
VASC	SANGUISORBA MENZIESII (1)	MENZIES BURNET	WA-STR
VASC	SPARGANIUM FLUCTUANS (1)	WATER BUR-REED	WA-STR
VASC	WOODWARDIA FIMBRIATA (1)	CHAIN-FERN	WA-STR

APPENDIX 3. Olympic National Forest Invasive Plants – Species Treatment Priority List (3-14-2011)

NRCS Code	Scientific Name	Common Name	Treatment Priority
AEPO	<i>Aegopodiumpodagraria</i>	Bishop's weed, goutweed	1
ARMI2	<i>Arctium minus</i>	Lesser burdock	2
BOOF	<i>Boragoofficinalis</i>	common borage	2
BRTE	<i>Bromustectorum</i>	Cheatgrass	1
BUDA2	<i>Buddlejadavidii</i>	butterfly bush	1
CESTM	<i>Centaureastoebessp. micranthus</i>	spotted knapweed	1
CEDI3	<i>Centaureadiffusa</i>	diffuse knapweed	1
CEDE5	<i>Centaureadebeauxii</i>	meadow knapweed	1
CEJA	<i>Centaureajacea</i>	brownray knapweed	1
CIAR4	<i>Cirsium arvense</i>	Canada thistle	2
CIVU	<i>Cirsiumvulgare</i>	bull thistle	2
COAR4	<i>Convolvulus arvensis</i>	field bindweed	2
CYES	<i>Cyperusesculentus</i>	yellow nutsedge	1
CYSC4	<i>Cytisusscoparius</i>	Scot's broom	2
DACA6	<i>Daucuscarota</i>	Queen Anne's lace	2
DIPU	<i>Digitalis purpurea</i>	purple foxglove	Tolerate
GERO	<i>Geranium robertianum</i>	Robert geranium	1
HEHE	<i>Hedera helix</i>	English ivy	2
HIAU	<i>Hieraciumaurantiacum</i>	orange hawkweed	1
HICA10	<i>Hieraciumcaespitosum</i>	meadow (yellow) hawkweed	1
HISA4	<i>Hieraciumsabaudum</i>	European hawkweed	1
HYPE	<i>Hypericumperforatum</i>	common St. Johnswort	Tolerate
HYRA3	<i>Hypochaerisradicata</i>	hairy catsear	Tolerate
ILAQ80	<i>Ilex aquifolium</i>	English holly	2
LALA4	<i>Lathyruslatifolius</i>	everlasting peavine	2
LASY	<i>Lathyrussylvestris</i>	flat pea	2
LEVU	<i>Leucanthemumvulgare</i>	oxeye daisy	Tolerate
LIVU2	<i>Linaria vulgaris</i>	butter and eggs	1
LAGA2	<i>Lamiastrumgaleobdolon</i>	yellow archangel	1
LOPE80	<i>Lotus pedunculatus</i>	big trefoil	Tolerate
LYPU2	<i>Lysimachiapunctata</i>	large yellow loosestrife	1
LYVU	<i>Lysimachia vulgaris</i>	garden yellow loosestrife	1
LYSA2	<i>Lythrumsalicaria</i>	purple loosestrife	1
PHAR3	<i>Phalaris arundinacea</i>	reed canarygrass	2
PLLA	<i>Plantagolanceolata</i>	narrowleaf plantain	Tolerate
POBO10	<i>Polygonumbohemicum</i>	Bohemian knotweed	1

POCU6	<i>Polygonumcuspidatum</i>	Japanese knotweed	1
POSA4	<i>Polygonumsachalinense</i>	giant knotweed	1
PORE5	<i>Potentilla recta</i>	sulphur cinquefoil	1
PRLA5	<i>Prunuslaurocerasus</i>	English laurel	2
RARER	<i>Ranunculus repens var repens</i>	creeping buttercup	Tolerate
RUDI2	<i>Rubus discolor</i>	Himalayan blackberry	2
RULA	<i>Rubus laciniatus</i>	cutleaf blackberry	2
SEJA	<i>Seneciojacobaea</i>	tansy ragwort	2
TAVU	<i>Tanacetumvulgare</i>	common tansy	2
TAOF	<i>Taraxacumofficinale</i>	common dandelion	Tolerate
VIMA	<i>Vinca major</i>	bigleaf periwinkle	1
VIMI2	<i>Vinca minor</i>	common periwinkle	1

APPENDIX 4. Plant Species Found at Rayonier Upper Fahnestock Creek Road Expansion Sites (Sites A and B).

Code	Scientific Name	Plant Type	Site A	Site B
ABGR	<i>Abies grandis</i>	Tree	x	x
ACMA	<i>Acer macrophyllum</i>	Tree		x
ALRU2	<i>Alnus rubra</i>	Tree	x	x
PISI	<i>Picea sitchensis</i>	Tree	x	
PSME	<i>Pseudotsuga menziesii</i>	Tree	x	x
TSHE	<i>Tsuga heterophylla</i>	Tree	x	x
THPL	<i>Thuja plicata</i>	Tree	x	x
GASH	<i>Gaultheria shallon</i>	Shrub	x	x
LIBO3	<i>Linna borealis</i>	Shrub		x
MANE2	<i>Mahonia nervosa</i>	Shrub	x	x
MEFE	<i>Menziesia ferruginea</i>	Shrub	x	x
OPHO	<i>Oplopanax horridus</i>	Shrub	x	
RIBR	<i>Ribes bracteosum</i>	Shrub	x	x
RUSP	<i>Rubus spectabilis</i>	Shrub	x	x
RUUR	<i>Rubus ursinus</i>	Shrub	x	x
SARA2	<i>Sambucus racemosa</i>	Shrub	x	x
VAAL3	<i>Vaccinium alaskense</i>	Shrub	x	x
VAME	<i>Vaccinium membranaceum</i>	Shrub	x	x
VAOV2	<i>Vaccinium ovatum</i>	Shrub	x	
VAPA	<i>Vaccinium parvifolium</i>	Shrub	x	
ARDI8	<i>Aruncus dioicus</i>	Herb	x	x
ASCA	<i>Asarum caudatum</i>	Herb		x
BOOC2	<i>Boykinia occidentalis</i>	Herb	x	x
CLSI2	<i>Claytonia sibirica</i>	Herb	x	x
DIFO	<i>Dicentra formosa</i>	Herb	x	x
DIPU	<i>Digitalis purpurea</i> *	Herb		x
EPAN	<i>Epilobium angustifolium</i>	Herb		x
GATR3	<i>Galium triflorum</i>	Herb	x	x
GOOB	<i>Goodyera oblongifolia</i>	Herb		x
HYPE	<i>Hypericum perforatum</i> *	Herb	x	
LEVU	<i>Leucanthemum vulgare</i> *	Herb	x	
MADI	<i>Maianthemum dilatatum</i>	Herb	x	
MAST4	<i>Maianthemum stellatum</i> (was <i>Smilacina stellatum</i>)	Herb	x	

Code	Scientific Name	Plant Type	Site A	Site B
MYMU	Mycelismuralis (was Lactucamuralis)	Herb	x	x
OXOR	Oxalis oregana	Herb	x	x
PLLA	Plantagolanceolata*	Herb		x
PYMI	Pyrola minor	Herb	x	x
RAOC	Ranunculus occidentalis	Herb	x	
RARE3	Ranunculus repens*	Herb		x
RUAQF	Rumexaquaticus var. fenestratus (was R. occidentalis)	Herb	x	x
STCA	Stellariacalycantha	Herb	x	x
TITR	Tiarella trifoliata	Herb		x
TIUN	Tiarella unifoliata	Herb		x
TROV	Trillium ovatum	Herb	x	
VEAM	Veronica americana	Herb	x	x
VESE	Veronica serpyllifolia	Herb		x
VIGL	Viola glabella	Herb	x	
VIOR	Viola orbiculata	Herb	x	x
BRVU	Bromus vulgaris	Grass	x	x
HOLA	Holcus lanatus	Grass	x	x
LUMU2	Luzulamultiflora	Rush	x	
LUPA4	Luzularparviflora	Rush	x	x
CADE9	Carex deweyana	Sedge		x
CAME6	Carex mertensii	Sedge	x	
ASTR2	Aspleniumtrichomanes	Fern	x	x
ATFI	Athyrium filix-femina	Fern	x	x
BLSP	Blechnum spicant	Fern	x	x
DREX2	Dryopteris expansa	Fern	x	x
POGL8	Polypodiumglyccyrhiza	Fern		x
POMU	Polystichum munitum	Fern	x	x
	Cladonia sp.	Lichen	x	
CLFU3	Cladoniafurcata	Lichen		x
HYHE3	Hypogymnia heterophylla	Lichen	x	x
HYEN60	Hypogymniaenteromorpha	Lichen	x	
HYME	Mypogymniametaphysodes	Lichen		x
PEBR21	Peltigerabrittanica	Lichen	x	
PIAC60	Pilophorusacicularis	Lichen	x	
PLGL60	Platismatiaglauca	Lichen	x	x
PLHE60	Platismatiaherrei	Lichen		x

Code	Scientific Name	Plant Type	Site A	Site B
USWI	Usneawirthii	Lichen	x	
HEAD	Herbertusaduncus	Liverwort	x	x
PLPO	Plagiochellaporelloides	Liverwort	x	
PONA7	Porellanavicularis	Liverwort	x	x
ANCU3	Antitrichiacurtipendula	Moss	x	x
CLCR4	Claopodiumcrispifolium	Moss	x	
EUOR2	Eurhynchiummoreganum	Moss		x
HOFU70	Homalotheciumfulgescens	Moss	x	
HYSP70	Hylocomiumsplendens	Moss	x	x
ISMY2	Isotheciummysoroides	Moss	x	x
LEAC8	Leucolepisacanthoneuron	Moss	x	x
ORLY	Orthotrichumlyellii	Moss	x	x
PLIN11	Plagiomnium insigne	Moss	x	x
PLUN4	Plagiotheciumundulatum	Moss	x	x
POCO38	Polytrichum commune	Moss	x	x
RHGL70	Rhizomniumglabrescens	Moss	x	x
RHLO70	Rhytidiadelphusloreus	Moss	x	x
RHTR70	Rhytidiadelphustriquestris	Moss		x
ULOB	Ulotaobtususcula	Moss	x	x
ULME	Ulotamegalospora	Moss	x	x

*indicates invasive plant (noxious weed) species